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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,419	12/07/2001	Oswin Ottinger	SGL 00/9	2778

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LERNER AND GREENBERG, P.A.  
POST OFFICE BOX 2480  
HOLLYWOOD, FL 33022-2480

EXAMINER
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FEELY, MICHAEL J

ART UNIT	PAPER NUMBER
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1712

DATE MAILED: 03/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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**Office Action Summary**

Application No.

10/006,419

Applicant(s)

OTTINGER ET AL.

Examiner

Michael J Feely

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 December 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☒ Claim(s) 1-13, 17-24 and 28-33 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1201,0503</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. On September 11, 2003, the Examiner previously handling this case discussed a restriction requirement with Laurence Greenberg. Mr. Greenberg made a provisional election with traverse to prosecute the invention of Group I, claims 1-30. After further consideration, the restriction requirement has been withdrawn. Hence claims 1-33 have been considered in the instant Office action.

### ***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Specification***

3. The disclosure is objected to because of the following informalities: on page 2 of the Specification, Applicant incorporates an EPO document into the instant specification. Incorporation of foreign documents into US Patent Application is improper.

Appropriate correction is required.

### ***Claim Objections***

4. Claims 17-24 and 28-30 are objected to because of the following informalities: these claims use the transitional phrase, "further comprising" to narrow the scope of a limitation that is already present in the claim. This transitional phrase is typically used when introducing a new limitation to the claims. Appropriate correction is required.

Claims 1-13 and 31-33 are objected to because of the following informalities: these claims feature a synthetic resin-*impregnated* body comprising graphite *containing* a

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polymerizable acrylic resin system or polymer obtained from said resin system. The term *impregnated* implies a porous structure filled with resin; however, the claim fails to describe such a structure. Rather, it discloses graphite that *contains* resin. Based on the specification and independent claim 14, a more accurate description would be: a primary product made of expanded or at least partially recompressed expanded graphite with an open pore system, and a resin impregnated in said open pore system.

Claims 2-13 are objected to because they are dependent from claim 1.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. The terms "low-viscosity" and "storage-stable" in claims 1, 14, and 31-33 are relative terms which renders the claim indefinite. The term "low-viscosity" and "storage-stable" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Regarding the "low-viscosity," Applicants discuss a viscosity below 20 mPa\*s (see lines 18-20 of page 14) but also mentions viscosities as high at 100 mPa\*s (see claim 22). This relative term is never clearly defined; hence, it is unclear what is meant by "low-viscosity".

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Regarding "storage-stable," Applicants define this term as a small rate of change in the viscosity of the resin at room temperature over a period of several weeks (see lines 1-5 of page 12). Reference is made to a specific resin that has no change in viscosity after eight days and a change of 1 mPa\*s after 48 days. It is unclear if "storage-stable" is defined by this specific example or something similar to this example.

Claims 2-13 and 15-30 are rejected because they are dependent from claims 1 and 14.

8. Claim 10 recites the limitation "wherein a *primary product* contains" in the resin-impregnated body according to claim 1. There is insufficient antecedent basis for this limitation in the claim.

9. The terms "good electrical conductivity" and "good thermal conductivity" in claim 11 are relative terms, which render the claim indefinite. The term terms "good electrical conductivity" and "good thermal conductivity" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Conductivity values are acceptable or unacceptable based upon the specific application or end use of the material. The claim language is generic with regards to end use; hence, "good electrical conductivity" and "good thermal conductivity" could be any value.

10. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: claim 12 discloses that the resin-impregnated body includes: a surface, regions close to said surface, and *another part*. It is unclear what this *other part* is.

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Based on lines 5-10 on page 14 of the Specification, it appears that this claim may be describing a partially impregnated body; however, the scope of this claim remains unclear.

***Claim Language Suggestions***

- Claim 1: A synthetic resin-impregnated body comprising a primary product formed of expanded or at least partially recompressed expanded graphite having a liquid-accessible pore system, wherein said primary product is impregnated with at least one of: at least one solvent-free polymerizable acrylic resin system; and polymers obtained by curing said at least one resin system.
- Claim 12: The synthetic resin-impregnated body according to claim 1, wherein said primary product is partially impregnated.
- Claim 14: A process for producing a resin-impregnated body, which comprises: providing a primary product formed of expanded or at least partially recompressed expanded graphite having a liquid-accessible pore system; impregnating the primary product with at least one solvent-free polymerizable acrylic resin system to form a resin-containing, uncured intermediate product; and finally subjecting the intermediate product to a curing treatment.
- Claim 31: A sealing element comprising: synthetic resin-impregnated body comprising a primary product formed of expanded or at least partially recompressed expanded graphite having a liquid-accessible pore system, wherein said primary product is impregnated with

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at least one of: at least one solvent-free polymerizable acrylic resin system; and polymers obtained by curing said at least one resin system.

Claim 32: A fuel cell component comprising: synthetic resin-impregnated body comprising a primary product formed of expanded or at least partially recompressed expanded graphite having a liquid-accessible pore system, wherein said primary product is impregnated with at least one of: at least one solvent-free polymerizable acrylic resin system; and polymers obtained by curing said at least one resin system.

Claim 33: A heat-conducting element comprising: synthetic resin-impregnated body comprising a primary product formed of expanded or at least partially recompressed expanded graphite having a liquid-accessible pore system, wherein said primary product is impregnated with at least one of: at least one solvent-free polymerizable acrylic resin system; and polymers obtained by curing said at least one resin system.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

12. Claims 1-6, 11-16, 19-24, and 31-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Woods (US Pat. No. 6,656,580) and Technical Data Sheets for Resinol 90C and Resinol RTC, provided by Loctite.

Normally, only one reference is used for a rejection under 35 U.S.C. 102; however, the use of multiple references is proper when the extra references are cited to: A) Prove the primary reference contains "enabled disclosure;" B) Explain the meaning of a term used in the primary reference; or C) Show that a characteristic not disclosed in the reference is inherent. In the instant case, Technical Data sheet are used to show inherent characteristics of the acrylic resin used in Woods.

Regarding claims 1-6 and 11-13, Woods (*with support of the Technical Data Sheets*) discloses, (1) A synthetic resin-impregnated body (column 4, lines 40-47) comprising a primary product formed of expanded or at least partially recompressed expanded graphite having a liquid-accessible pore system (column 4, line 50 through column 5, line 5), wherein said primary product is impregnated (column 5, lines 20-35) with at least one of: at least one solvent-free



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polymerizable acrylic resin system; and polymers obtained by curing said at least one resin system (column 5, lines 5-10; Technical Data Sheets for Resinol 90C and Resinol RTC); **(2)** wherein said at least one acrylic resin system contains triethyleneglycol dimethacrylate (column 9, lines 45-56) and at least one initiator system (column 10, lines 13-27); **(3)** wherein said at least one acrylic resin system contains azo initiators as said at least one initiator (column 10, lines 49-67); **(4)** wherein said azo initiators contained in at least one acrylic resins systems are selected from the group consisting of 2,2'-dimethyl-2,2'-asodipropiononitrile, 1,1'-azobis(1-cyclohexanecarbonitrile) and azoisobutyric acid nitrile (column 10, lines 49-67); **(5)** wherein said at least one acrylic resin system has a storage stability at room temperature of more than two days (column 5, lines 5-10; Technical Data Sheets for Resinol 90C); **(6)** herein said at least one acrylic resin system has a storage stability at room temperature of more than two weeks (column 5, lines 5-10; Technical Data Sheets for Resinol 90C); **(11)** including at least two independently held together networks, one of said networks being formed of a connected framework made of expanded or expanded and thereafter at least partially recompressed graphite with electrical and thermal conductivity, and the other of said networks being a connected network made of synthetic material having penetrated into said pore system (column 4, line 50 through column 5, line 5; column 5, lines 20-35); **(12)** wherein said primary product is partially impregnated (column 6, lines 12-22); and **(13)** wherein a continuous resin surface film is not present and the body is electrically conductive (column 6, lines 50-59; column 4, lines 11-16).

Regarding claims 31-33, Woods (*with support of the Technical Data Sheets*) discloses, **(31)** a sealing element (column 4, lines 11-17), **(32)** a fuel cell component (column 4, lines 11-17), and **(33)** a heat conducting element (column 4, lines 11-17) comprising a synthetic resin-

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impregnated body (column 4, lines 40-47) comprising a primary product formed of expanded or at least partially recompressed expanded graphite having a liquid-accessible pore system (column 4, line 50 through column 5, line 5), wherein said primary product is impregnated (column 5, lines 20-35) with at least one of: at least one solvent-free polymerizable acrylic resin system; and polymers obtained by curing said at least one resin system (column 5, lines 5-10; Technical Data Sheets for Resinol 90C and Resinol RTC).

Regarding claims 14-16 and 19-24, Woods (*with support of the Technical Data Sheets*) discloses **(14)** a process for producing a resin-impregnated body (column 5, lines 20-36), which comprises: providing a primary product formed of expanded or at least partially recompressed expanded graphite having a liquid-accessible pore system (column 4, line 50 through column 5, line 5); impregnating the primary product with at least one solvent-free polymerizable acrylic resin system to form a resin-containing, uncured intermediate product (column 5, lines 5-10; Technical Data Sheets for Resinol 90C and Resinol RTC); and finally subjecting the intermediate product to a curing treatment (column 10, lines 36-49); **(15)** which further comprises processing the resin-containing, uncured intermediate product to form a shaped body (column 5, lines 30-36); and carrying out the subjecting step by subjecting the uncured shaped body produced from the uncured intermediate product to a curing treatment for the at least one resin system (column 10, lines 36-49); **(16)** which further comprises simultaneously shaping the acrylic resin-containing body (column 5, lines 30-55) and curing the resin system that is present as a result of temperature impact (column 10, lines 36-49); **(19)** wherein the primary product has a bulk density in a range of from 0.1 to 1.8 g/cm<sup>3</sup> (column 4, lines 57-61); **(20)** wherein the primary product has a bulk density in a range of from 0.3 to 1.5 g/cm<sup>3</sup> (column 4, lines 57-61);

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(21) wherein the primary product has a bulk density in a range of from 0.5 to 1.3 g/cm<sup>3</sup> (column 4, lines 57-61); (22) wherein the acrylic resin has a viscosity at room temperature of less than 100 mPa\*s (column 5, lines 5-10; Technical Data Sheets for Resinol 90C); (23) wherein the acrylic resin has a viscosity at room temperature of less than 50 mPa\*s (column 5, lines 5-10; Technical Data Sheets for Resinol 90C); and (24) wherein the acrylic resin has a viscosity at room temperature of less than 20 mPa\*s (column 5, lines 5-10; Technical Data Sheets for Resinol 90C).

In the above rejections, the impregnated carbon body would have been inherently thermally and electrically conductive due to the inherent conductive nature of the graphite material. In addition, the acrylic resins would have been inherently "solvent-free" because the Technical Data Sheets provide no detail regarding a solvent presence or content.

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 7-9 and 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woods (US Pat. No. 6,656,580) and Technical Data Sheets for Resinol 90C and Resinol RTC, provided by Loctite.

Regarding claims 7-9 and 25-29, Woods is silent regarding providing specific "take-up" values of up to 100% (up to 50 wt% acrylic), 5-35% (5 to 25 wt% acrylic), and 10-25% (10 to 20 wt% acrylic). However, he discloses, "the amount of sealant up-take can be controlled over a

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wide range by varying the impregnation pressure, temperature, sealant viscosity, impregnation time of density of the sheet,” (column 6, lines 33-36). Applicant fails to show criticality for this range, and this range is result effective because it has a direct impact on the process-ability and shaping capability of the impregnated sheet. In light of Woods’ teaching, it would have been know to one skilled in the art to tailor the “up-take” value by choosing the appropriate processing and material parameters.

Furthermore, it has been found that, “where general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranged by routine experimentation,” – *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Therefore it would have been obvious to provide the specific “take-up” values of up to 100% (up to 50 wt% acrylic), 5-35% (5 to 25 wt% acrylic), and 10-25% (10 to 20 wt% acrylic) in the impregnated body of Woods because Woods discloses that the “take up” can be tailored by numerous process and material parameters, resulting in desirable process-ability and shaping capability of the impregnated body.

#### ***Allowable Subject Matter***

15. Claims 10, 17, 18, and 30 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 10 and 30, Woods provides no motivation to include fillers in the porous graphite sheet.

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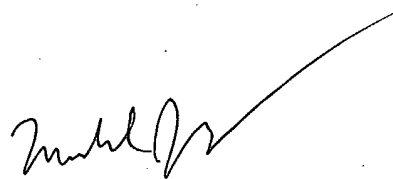
Regarding claims 17 and 18, Woods is silent regarding the ash value of porous graphite, and the prior art fails to shed light on the ash value of these materials.

***Communication***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Feely whose telephone number is 571-272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Michael J. Feely  
Patent Examiner  
Art Unit 1712

March 8, 2004